

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
19 February 2004 (19.02.2004)

PCT

(10) International Publication Number
WO 2004/014418 A3

(51) International Patent Classification⁷: **A61K 39/095**

(21) International Application Number:
PCT/EP2003/008571

(22) International Filing Date: 31 July 2003 (31.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

0218037.0	2 August 2002 (02.08.2002)	GB
0218036.2	2 August 2002 (02.08.2002)	GB
0218035.4	2 August 2002 (02.08.2002)	GB
0218051.1	2 August 2002 (02.08.2002)	GB
0220197.8	30 August 2002 (30.08.2002)	GB
0220199.4	30 August 2002 (30.08.2002)	GB
0225524.8	1 November 2002 (01.11.2002)	GB
0225531.3	1 November 2002 (01.11.2002)	GB
0230164.6	24 December 2002 (24.12.2002)	GB
0230168.7	24 December 2002 (24.12.2002)	GB
0230170.3	24 December 2002 (24.12.2002)	GB
0305028.3	5 March 2003 (05.03.2003)	GB

(71) Applicant (for all designated States except US): **GLAXO-SMITHKLINE BIOLOGICALS S.A.** [BE/BE]; Rue de l'Institut 89, B-1330 Rixensart Brussels (BE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BERTHET, Francois-Xavier, Jacques** [FR/BE]; GlaxoSmithKline Biologicals s.a., Rue de l'Institut 89, B-1330 Rixensart Brussels (BE). **BIEMANS, Ralph** [BE/BE]; GlaxoSmithKline Biologicals s.a., Rue de l'Institut 89, B-1330 Rixensart Brussels (BE). **DENOEL, Philippe** [BE/BE]; GlaxoSmithKline Biologicals s.a., Rue de l'Institut 89, B-1330 Rixensart Brussels (BE). **FERON, Christiane** [BE/BE]; GlaxoSmithKline Biologicals s.a., Rue de l'Institut 89, B-1330 Rixensart

Brussels (BE). **GORAJ, Karine** [BE/BE]; GlaxoSmithKline Biologicals S.A., Rue de l'Institut 89, B-1330 Rixensart Brussels (BE). **POOLMAN, Jan** [NL/BE]; GlaxoSmithKline Biologicals s.a., Rue de l'Institut 89, B-1330 Rixensart Brussels (BE). **WEYNANTS, Vincent** [BE/BE]; GlaxoSmithKline Biologicals s.a., Rue de l'Institut 89, B-1330 Rixensart Brussels (BE).

(74) Agent: **STEPHEN, Robert**; GlaxoSmithKline, GSK House, 980 Great West Road, Brentford, Middlesex TW8 9EP (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
22 July 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: NEISSERIAL VACCINE COMPOSITIONS COMPRISING A COMBINATION OF ANTIGENS

(57) Abstract: The present invention relates to immunogenic compositions and vaccines for the treatment and prevention of Neisserial disease. Immunogenic compositions of the invention contain combinations of antigens selected from at least two different classes of antigens including adhesins, autotransporter proteins, toxins, iron acquisitions proteins and membrane-associated protein (preferably integral outer membrane protein)s. Such combinations of antigens are able to target the immune response against different aspects of the neisserial life cycle, resulting in a more effective immune response.

INTERNATIONAL SEARCH REPORT

I
PC 03/08571

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K39/095

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/09350 A (DALEMANS WILFRIED L J ;SMITHKLINE BEECHAM BIOLOG (BE); THIRY GEORG) 8 February 2001 (2001-02-08) cited in the application	1,2,5-7, 9,11-13, 16,20, 22,24, 46-61, 63-69, 71,72, 74-76
Y	abstract page 20, line 13 - line 22 page 25, line 11 -page 26, line 24 -/-	1,2, 5-16,20, 22-24, 27,28, 45-61, 63-69, 71,72, 74-76, 82-91

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- A" document defining the general state of the art which is not considered to be of particular relevance
- E" earlier document but published on or after the international filing date
- L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- O" document referring to an oral disclosure, use, exhibition or other means
- P" document published prior to the international filing date but later than the priority date claimed

- T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- X" document of particular relevance; the claimed Invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- Y" document of particular relevance; the claimed Invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- &" document member of the same patent family

Date of the actual completion of the international search

20 April 2004

Date of mailing of the international search report

25.05.2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Noë, V

INTERNATIONAL SEARCH REPORT

International Application No

PCT/03/08571

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	page 31, line 1 - line 22 page 33, line 1 -page 34, line 17 page 26, line 5 - line 32 example 8 claims 14-20,36,37 --- WO 00/71725 A (PIZZA MARIAGRAZIA ;RAPPOLI RINO (IT); CHIRON SPA (IT); GIULIANI M) 30 November 2000 (2000-11-30) cited in the application	1-4, 11-13, 16,20, 22-24, 62-68, 70,76-81
Y	abstract	1-4, 11-16, 20, 22-24, 27,28, 62-68, 70,76-81
X	page 1, line 26 - line 30 page 2, line 12 -page 3, line 1 page 54, line 27 -page 55, line 21 example 9 --- WO 00/25811 A (GORRINGE ANDREW RICHARD ;HUDSON MICHAEL JOHN (GB); MICROBIOLOGICAL) 11 May 2000 (2000-05-11)	1-3,20
Y	abstract	4-8,11, 12
X	page 3, line 6 - line 19 page 7, line 5 -page 8, line 3 --- WO 01/52885 A (PIZZA MARIAGRAZIA ;RAPPOLI RINO (IT); CHIRON SPA (IT); GIULIANI M) 26 July 2001 (2001-07-26)	1,2,5-8, 11-13, 16,20, 22-24
Y	abstract	1,2, 5-16,20, 22-24, 27,28, 45-49, 52-61, 63,64, 66,67, 71-73,76
	page 2, line 5 - line 24 page 8, line 24 -page 10, line 17 page 33, line 32 -page 35, line 22 claims 1,2,4-8 --- -/-/	

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/08571

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 98/02547 A (RUELLE JEAN LOUIS ;VINALS CARLA (BE); MAX PLANCK GESELLSCHAFT (DE)) 22 January 1998 (1998-01-22) cited in the application page 81 -page 90 claims 8,23,31 ---	1-5, 7-10,16, 45-81
Y	WO 99/31132 A (JENNINGS MICHAEL PAUL ;PEAK IAN RICHARD ANSELM (AU); UNIV QUEENSLA) 24 June 1999 (1999-06-24) cited in the application abstract page 2, line 28 -page 3, line 5 page 4, line 1 - line 6 page 7, line 10 - line 21 page 10, line 3 - line 15 page 29, line 9 -page 30, line 26 page 34, line 10 - line 17 page 37, line 7 - line 11 page 37, line 32 -page 38, line 11 page 39, line 22 - line 25 ---	1-15,24, 45-82,85
Y	WO 01/55182 A (UNIV QUEENSLAND) 2 August 2001 (2001-08-02) cited in the application abstract page 2, line 15 - line 31 page 3, line 7 - line 8 page 5, line 2 - line 4 page 6, line 5 - line 11 page 11, line 7 - line 16 page 22, line 27 - line 31 page 28, line 9 - line 11 page 32, line 6 - line 12 page 34, line 8 - line 17 page 35, line 1 - line 5 example 10 ---	1-15,24, 45-82,85
Y	WO 99/55873 A (SMITHKLINE BEECHAM BIOLOG ;THONNARD JOELLE (BE)) 4 November 1999 (1999-11-04) cited in the application abstract page 3, line 14 - line 21 page 4, line 1 - line 10 page 25, line 9 - line 24 page 26, line 9 - line 10 page 32, line 13 -page 33, line 14 page 35, line 4 - line 6 page 36, line 26 -page 37, line 7 page 39, line 1 - line 19 example 3 claims 17-19 ---	1-10,13, 23,45-81
		-/-

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/08571

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JENNINGS H J ET AL: "CONJUGATION OF MENINGOCOCCAL LIPOPOLYSACCHARIDE R-TYPE OLIGOSACCHARIDES TO TETANUS TOXOID AS ROUTE TO A POTENTIAL VACCINE AGAINST GROUP B NEISSERIA MENINGITIDIS" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY, WASHINGTON, US, vol. 43, no. 1, January 1984 (1984-01), pages 407-412, XP009000590 ISSN: 0019-9567 abstract page 407, column 1, paragraph 1 page 409, column 1, paragraph 2 -column 2, paragraph 2 page 412, column 1 ---	1-10, 27, 28, 63, 64, 66, 67, 77, 78
Y	RUNE ANDERSEN S ET AL: "Lipopolysaccharide heterogeneity and escape mechanisms of Neisseria meningitidis: possible consequences for vaccine development" MICROBIAL PATHOGENESIS, ACADEMIC PRESS LIMITED, NEW YORK, NY, US, vol. 23, 1997, pages 139-155, XP002108656 ISSN: 0882-4010 abstract page 140, column 1, paragraph 1 - paragraph 4 page 149, column 2, paragraph 4 -page 150, column 1, paragraph 1 ---	1, 2, 5-15, 28, 45-49, 52-61, 63-69, 71-76, 82-91
X	FREDRIKSEN J H ET AL: "PRODUCTION CHARACTERIZATION AND CONTROL OF MENB-VACCINE FOLKEHELSA AN OUTER MEMBRANE VESICLE VACCINE AGAINST GROUP B MENINGOCOCCAL DISEASE" NIPH (NATIONAL INSTITUTE OF PUBLIC HEALTH) ANNALS (OSLO), vol. 14, no. 2, 1991, pages 67-80, XP002948832 MEETING ON THE MENINGOCOCCAL SEROGROUP B VACCINE PROTECTION TRIAL IN NORWAY 1988-1991, OSLO, NORWAY, ISSN: 0332-5652 abstract	1, 2
Y	page 68, paragraph 6 -page 69 page 72, last paragraph -page 75, paragraph 4; figures 2,3; tables 2,3 ---	5, 6, 28
Y	GAO LIHUI HU XUJING ET AL: "Study on the LOS antigenicity of 2 candidate strains for meningococcal vaccine of serogroup B" BIOSIS, XP002133714 abstract ----	1-4, 15, 28

-/--

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/08571

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>VERHEUL A F M ET AL: "PREPARATION, CHARACTERIZATION, AND IMMUNOGENICITY OF MENINGOCOCCAL IMMUNOTYPE L2 AND L3,7,9 PHOSPHOETHANOLAMINE GROUP-CONTAINING OLIGOSACCHARIDE-PROTEIN CONJUGATES" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 59, no. 3, 1 March 1991 (1991-03-01), pages 843-851, XP002032436 ISSN: 0019-9567 abstract page 844, column 2, last line page 845, column 1, paragraph 1 page 847, column 1, paragraph 2 -column 2, paragraph 3 page 850, column 2, last paragraph ---</p>	1-4,27, 28,50, 51,61
A	<p>QUAKYI E K ET AL: "MODULATION OF THE BIOLOGICAL ACTIVIES OF MENINGOCOCCAL ENDOTOXINS BY ASSOCIATION WITH OUTER MEMBRANE PROTEINS IS NOT INEVITABLY LINKED TO TOXICITY" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 65, no. 5, May 1997 (1997-05), pages 1972-1979, XP001184760 ISSN: 0019-9567 abstract ---</p>	
A	<p>WO 01/72337 A (GORRINGE ANDREW RICHARD ;HUDSON MICHAEL JOHN (GB); MICROBIOLOGICAL) 4 October 2001 (2001-10-04) abstract page 8, line 11 - line 35 page 10, line 1 -page 11, line 10 ---</p>	
Y	<p>WO 00/23595 A (JUDD RALPH C ;MANNING SCOTT D (US); UNIV MONTANA (US)) 27 April 2000 (2000-04-27) cited in the application abstract page 1, line 8 - line 11 page 6, line 1 - line 4 page 6, line 26 - line 27 page 7, line 3 - line 14 page 8, line 7 - line 14 page 11, line 17 - line 24 page 33, line 9 - line 20 page 34, line 12 - line 18 page 35, paragraphs 2,4 page 36, paragraph 2 page 37, line 12 - line 24 ---</p>	1-10,22, 45-49, 52-81,86
		-/-

INTERNATIONAL SEARCH REPORT

International Application No

PCT

03/08571

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JENNINGS M P ET AL: "Molecular analysis of a locus for the biosynthesis and phase-variable expression of the lacto-N-tetraose terminal lipopolysaccharides structure in <i>Neisseria meningitidis</i> " MOLECULAR MICROBIOLOGY, BLACKWELL SCIENTIFIC, OXFORD, GB, vol. 18, no. 4, 1995, pages 729-740, XP002084665 ISSN: 0950-382X abstract page 730, column 1, paragraph 2 page 731, column 1, paragraph 2 -column 2, paragraph 1 page 733, column 1, paragraph 2 -page 734, column 1, paragraph 2 page 737, column 1, last paragraph -column 2 ---	45,88
A	WO 94/08021 A (LEY PETER ANDRE V D ;NEDERLANDEN STAAT (NL); POOLMAN JAN THEUNIS () 14 April 1994 (1994-04-14) abstract page 5, line 13 -page 6, line 16 page 6, line 31 -page 7, line 8 ---	82-91
A	VAN ULSSEN PETER ET AL: "In vivo expression of <i>Neisseria meningitidis</i> proteins homologous to the <i>Haemophilus influenzae</i> Hap and Hia autotransporters" FEMS IMMUNOLOGY AND MEDICAL MICROBIOLOGY, vol. 32, no. 1, December 2001 (2001-12), pages 53-64, XP001189744 ISSN: 0928-8244 cited in the application abstract page 54, column 1, paragraph 2 page 57, column 2, paragraph 3 -page 58 page 63, column 1, last paragraph -column 2 ---	
A	TETTELIN H ET AL: "COMPLETE GENOME SEQUENCE OF <i>NEISSERIA MENINGITIDIS</i> SEROGROUP B STRAIN MC58" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, US, vol. 287, 2000, pages 1809-1815, XP000914963 ISSN: 0036-8075 -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/08571

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 63-65,80 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

As a result of the prior review under R. 40.2(e) PCT,
no additional fees are to be refunded.

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

1-10,45-81 (partially),11-16,22-24,27,28,82-91 (completely)
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-5,7-10,45-91 (partially),16 (completely)

Immunogenic compositions comprising FhaB and another Neisserial antigen or nucleotides thereof.
Vaccines comprising said immunogenic composition; methods of treatment of Neisserial disease administering said vaccines.
Use of said vaccines in the preparation of a medicament for the treatment and the prevention of Neisserial infection.
Genetically engineered Neisserial strain with upregulated expression of FhaB and the other antigen.
Methods of preparation of said immunogenic composition and vaccine.
Method of preparing an immune globulin by immunising a recipient with said vaccine, immune globulin prepared by this method, pharmaceutical composition comprising this immune globulin and method of treatment or prevention of Neisserial infection comprising administering said pharmaceutical composition.

2. Claims: 1-10,45-91 (partially),17 (completely)

see invention 1 but concerning immunogenic compositions comprising NspA and another Neisserial antigen or nucleotides thereof.

3. Claims: 1-5,7-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising PilC and another Neisserial antigen or nucleotides thereof.

4. Claims: 1-10,45-91 (partially),11-15,24 (completely)

see invention 1 but concerning immunogenic compositions comprising Hsf and another Neisserial antigen or nucleotides thereof.

5. Claims: 1-10,13,45-91 (partially), 23 (completely)

see invention 1 but concerning immunogenic compositions comprising Hap and another Neisserial antigen or nucleotides thereof.

6. Claims: 1-3,5-10,45-91 (partially),34 (completely)

see invention 1 but concerning immunogenic compositions

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

comprising MafA and another Neisserial antigen or nucleotides thereof.

7. Claims: 1-3,5-10,45-91 (partially),35(completely)
see invention 1 but concerning immunogenic compositions comprising MafB and another Neisserial antigen or nucleotides thereof.

8. Claims: 1-3,5,7,9,10,45-91 (partially)
see invention 1 but concerning immunogenic compositions comprising Omp26 and another Neisserial antigen or nucleotides thereof.

9. Claims: 1-5,7-10,45-91 (partially),36 (completely)
see invention 1 but concerning immunogenic compositions comprising NMB0315 and another Neisserial antigen or nucleotides thereof.

10. Claims: 1-5,7-10,45-91 (partially),40 (completely)
see invention 1 but concerning immunogenic compositions comprising NMB00995 and another Neisserial antigen or nucleotides thereof.

11. Claims: 1-5,7-10,45-91 (partially),37(completely)
see invention 1 but concerning immunogenic compositions comprising NMB1119 and another Neisserial antigen or nucleotides thereof.

12. Claims: 1-5,7-10,45-91 (partially),18 (completely)
see invention 1 but concerning immunogenic compositions comprising NadA and another Neisserial antigen or nucleotides thereof.

13. Claims: 1-3,5,7,9,10,45-91 (partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

see invention 1 but concerning immunogenic compositions comprising IgA protease and another Neisserial antigen or nucleotides thereof.

14. Claims: 1-3,5-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising AspA and another Neisserial antigen or nucleotides thereof.

15. Claims: 1-5,7-10,13-15,45-91 (partially),25 (completely)

see invention 1 but concerning immunogenic compositions comprising FrpA and another Neisserial antigen or nucleotides thereof.

16. Claims: 1-5,7-10,45-91 (partially),26 (completely)

see invention 1 but concerning immunogenic compositions comprising FrpC and another Neisserial antigen or nucleotides thereof.

17. Claims: 1-3,5,7-10,45-91 (partially),36 (completely)

see invention 1 but concerning immunogenic compositions comprising FrpA/C and another Neisserial antigen or nucleotides thereof.

18. Claims: 1-3,5,7,9,10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising VapD and another Neisserial antigen or nucleotides thereof.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

19. Claims: 1-3,5-10,45-91 (partially),33 (completely)

see invention 1 but concerning immunogenic compositions comprising NM-ADPRT and another Neisserial antigen or nucleotides thereof.

20. Claims: 1-10,45-81 (partially),14,15,27,28, 82-91 (completely)

see invention 1 but concerning immunogenic compositions comprising LPS immunotype L2 and/or LPS immunotype L3 and another Neisserial antigen or nucleotides thereof.

21. Claims: 1-3,5-10,45-91 (partially),11,13-15,19 (completely)

see invention 1 but concerning immunogenic compositions comprising TbpA high and another Neisserial antigen or nucleotides thereof.

22. Claims: 1-3,5-10,45-91 (partially)12-15,20 (completely)

see invention 1 but concerning immunogenic compositions comprising TbpA low and another Neisserial antigen or nucleotides thereof.

23. Claims: 1-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising TbpB high and another Neisserial antigen or nucleotides thereof.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

24. Claims: 1-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising TbpB low and another Neisserial antigen or nucleotides thereof.

25. Claims: 1-3,5-10,45-91 (partially),39 (completely)

see invention 1 but concerning immunogenic compositions comprising LbpA and another Neisserial antigen or nucleotides thereof.

26. Claims: 1-10,13-15,45-91 (partially),21,(completely)

see invention 1 but concerning immunogenic compositions comprising LbpB and another Neisserial antigen or nucleotides thereof.

27. Claims: 1-3,5-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising P2086 and another Neisserial antigen or nucleotides thereof.

28. Claims: 1-3,5-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising HpuA and another Neisserial antigen or nucleotides thereof.

29. Claims: 1-3,5-10,45-91 (partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

see invention 1 but concerning immunogenic compositions comprising HpuB and another Neisserial antigen or nucleotides thereof.

30. Claims: 1-5,7-10,45-91 (partially), 41 (completely)

see invention 1 but concerning immunogenic compositions comprising Lipo28 and another Neisserial antigen or nucleotides thereof.

31. Claims: 1-3,5,7,9-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising Sibp and another Neisserial antigen or nucleotides thereof.

32. Claims: 1-3,5,7-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising FpbA and another Neisserial antigen or nucleotides thereof.

33. Claims: 1-3,5,9-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising BfrA and another Neisserial antigen or nucleotides thereof.

34. Claims: 1-3,5,7,9,10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising BfrB and another Neisserial antigen or nucleotides thereof.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

35. Claims: 1-3,5,7,9-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising Bcp and another Neisserial antigen or nucleotides thereof.

36. Claims: 1-3,5,7,9-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising NMB0964 and another Neisserial antigen or nucleotides thereof.

37. Claims: 1-3,5,7,9-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising NMB0293 and another Neisserial antigen or nucleotides thereof.

38. Claims: 1-3,5,7-10,45-91 (partially),29 (completely)

see invention 1 but concerning immunogenic compositions comprising PilQ and another Neisserial antigen or nucleotides thereof.

39. Claims: 1-10,,13-15,45-91 (partially),22 (completely)

see invention 1 but concerning immunogenic compositions comprising OMP85 and another Neisserial antigen or nucleotides thereof.

40. Claims: 1-3,5-10,45-91 (partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

see invention 1 but concerning immunogenic compositions comprising FhaC and another Neisserial antigen or nucleotides thereof.

41. Claims: 1-3,5-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising TspA and another Neisserial antigen or nucleotides thereof.

42. Claims: 1-3,5-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising TspB and another Neisserial antigen or nucleotides thereof.

43. Claims: 1-3,5-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising TdfH and another Neisserial antigen or nucleotides thereof.

44. Claims: 1-3,5-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising PorB and another Neisserial antigen or nucleotides thereof.

45. Claims: 1-3,5-10,45-91 (partially),42 (completely)

see invention 1 but concerning immunogenic compositions comprising HimD and another Neisserial antigen or nucleotides thereof.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

46. Claims: 1-3,5-10,45-91 (partially),38 (completely)

see invention 1 but concerning immunogenic compositions comprising HisD and another Neisserial antigen or nucleotides thereof.

47. Claims: 1-3,5-10,45-91 (partially),32 (completely)

see invention 1 but concerning immunogenic compositions comprising GNA1870 and another Neisserial antigen or nucleotides thereof.

48. Claims: 1-3,5-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising OstA and another Neisserial antigen or nucleotides thereof.

49. Claims: 1-3,5-10,45-91 (partially),30 (completely)

see invention 1 but concerning immunogenic compositions comprising HlpA and another Neisserial antigen or nucleotides thereof.

50. Claims: 1-3,5-10,45-91 (partially),31 (completely)

see invention 1 but concerning immunogenic compositions comprising MltA and another Neisserial antigen or nucleotides thereof.

51. Claims: 1-3,5,7,9,10,45-91 (partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

see invention 1 but concerning immunogenic compositions comprising NMB1124 and another Neisserial antigen or nucleotides thereof.

52. Claims: 1-3,5,7,9-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising NMB1162 and another Neisserial antigen or nucleotides thereof.

53. Claims: 1-3,5,7,9-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising NMB1220 and another Neisserial antigen or nucleotides thereof.

54. Claims: 1-3,5,7,9-10,45-91 (partially),43 (completely)

see invention 1 but concerning immunogenic compositions comprising NMB1313 and another Neisserial antigen or nucleotides thereof.

55. Claims: 1-3,5,7,9-10,45-91 (partially),44 (completely)

see invention 1 but concerning immunogenic compositions comprising NMB1953 and another Neisserial antigen or nucleotides thereof.

56. Claims: 1-3,5,7,9-10,45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising HtrA and another Neisserial antigen or nucleotides thereof.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

57. Claims: 1-10, 45-91 (partially)

see invention 1 but concerning immunogenic compositions comprising PldA and another Neisserial antigen or nucleotides thereof.

INTERNATIONAL SEARCH REPORT

I
nternational Application No

PCT/03/08571

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 0109350	A	08-02-2001	AU	770360 B2		19-02-2004
			AU	6833600 A		19-02-2001
			BR	0012974 A		07-05-2002
			CA	2380840 A1		08-02-2001
			CN	1377415 T		30-10-2002
			CZ	20020403 A3		15-05-2002
			WO	0109350 A2		08-02-2001
			EP	1208214 A2		29-05-2002
			HU	0203056 A2		28-12-2002
			JP	2003506049 T		18-02-2003
			NO	20020506 A		02-04-2002
			PL	353891 A1		15-12-2003
			TR	200200275 T2		21-05-2002
			TR	200202448 T2		21-01-2003

WO 0071725	A	30-11-2000	AU	5097700 A		12-12-2000
			BR	0010721 A		11-06-2002
			CA	2373236 A1		30-11-2000
			CN	1362992 T		07-08-2002
			EP	1179072 A2		13-02-2002
			WO	0071725 A2		30-11-2000
			JP	2003500420 T		07-01-2003
			NZ	515935 A		30-01-2004

WO 0025811	A	11-05-2000	AT	242640 T		15-06-2003
			AU	760858 B2		22-05-2003
			AU	1056900 A		22-05-2000
			BR	9914946 A		10-07-2001
			CA	2349331 A1		11-05-2000
			DE	69908805 D1		17-07-2003
			DK	1126874 T3		29-09-2003
			EP	1297844 A2		02-04-2003
			EP	1126874 A2		29-08-2001
			ES	2197688 T3		01-01-2004
			WO	0025811 A2		11-05-2000
			JP	2002528515 T		03-09-2002
			PT	1126874 T		31-10-2003
			US	2003215469 A1		20-11-2003

WO 0152885	A	26-07-2001	AU	2875401 A		31-07-2001
			CA	2397508 A1		26-07-2001
			CN	1416352 T		07-05-2003
			EP	1248647 A1		16-10-2002
			WO	0152885 A1		26-07-2001
			JP	2003520248 T		02-07-2003
			NZ	520466 A		26-09-2003

WO 9802547	A	22-01-1998	FR	2751000 A1		16-01-1998
			AU	730423 B2		08-03-2001
			AU	3697797 A		09-02-1998
			CA	2260079 A1		22-01-1998
			EP	0951552 A2		27-10-1999
			WO	9802547 A2		22-01-1998
			JP	2001504684 T		10-04-2001
			US	2002164603 A1		07-11-2002

WO 9931132	A	24-06-1999	AU	747742 B2		23-05-2002
			AU	1649599 A		05-07-1999

INTERNATIONAL SEARCH REPORT

tional Application No

PCT/03/08571

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9931132	A	WO 9931132 A1 BR 9814276 A CA 2314319 A1 CN 1284965 T EP 1045859 A1 HU 0100094 A2 JP 2002508394 T NO 20002990 A NZ 505374 A PL 341160 A1 TR 200001709 T2 US 6495345 B1 US 2002102276 A1	24-06-1999 03-10-2000 24-06-1999 21-02-2001 25-10-2000 28-05-2001 19-03-2002 08-08-2000 01-03-2002 26-03-2001 21-03-2001 17-12-2002 01-08-2002
WO 0155182	A 02-08-2001	WO 0155182 A1 AU 2818101 A BR 0107857 A CA 2398139 A1 CN 1419564 T CZ 20022482 A3 EP 1252182 A1 HU 0300696 A2 JP 2003523208 T NO 20023487 A NZ 520445 A US 2002160016 A1	02-08-2001 07-08-2001 29-10-2002 02-08-2001 21-05-2003 15-01-2003 30-10-2002 28-07-2003 05-08-2003 24-09-2002 27-02-2004 31-10-2002
WO 9955873	A 04-11-1999	AU 3928499 A CA 2326375 A1 CN 1336957 T WO 9955873 A2 EP 1071783 A2 JP 2002512800 T US 6696062 B1	16-11-1999 04-11-1999 20-02-2002 04-11-1999 31-01-2001 08-05-2002 24-02-2004
WO 0172337	A 04-10-2001	AU 4260201 A CA 2403993 A1 EP 1267938 A1 WO 0172337 A1 JP 2003528157 T US 2003082211 A1	08-10-2001 04-10-2001 02-01-2003 04-10-2001 24-09-2003 01-05-2003
WO 0023595	A 27-04-2000	WO 0023595 A1 CA 2347849 A1 EP 1123403 A1	27-04-2000 27-04-2000 16-08-2001
WO 9408021	A 14-04-1994	NL 9201716 A AU 684720 B2 AU 4835193 A CA 2146145 A1 EP 0680512 A1 FI 951535 A JP 8501940 T WO 9408021 A1 NO 951181 A US 5705161 A	02-05-1994 08-01-1998 26-04-1994 14-04-1994 08-11-1995 01-06-1995 05-03-1996 14-04-1994 01-06-1995 06-01-1998